



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,305	11/14/2006	Nancy Dean	H0004275.84418 US2 - 4018	6412
63993 7590 06/30/2008				
BUCHALTER NEMER 18400 VON KARMAN AVE. SUITE 800 IRVINE, CA 92612				
EXAMINER COLEMAN, WILLIAM D				
ART UNIT		PAPER NUMBER		
2823				
MAIL DATE		DELIVERY MODE		
06/30/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/551,305

Applicant(s)

DEAN ET AL.

Examiner

W. David Coleman

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-893)
Paper No(s)/Mail Date 10/05/04/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Nguyen U.S.

Patent Application Publication No. 2001/0038093 A1.

Pertaining to claim 1, Nguyen teaches a thermal transfer material, comprising:
a heat spreader component, wherein the heat spreader component comprises a top surface, a bottom surface and at least one heat spreader material, and
at least one thermal interface material, wherein the thermal interface material is directly deposited onto at least part of the bottom surface of the heat spreader component.

Pertaining to claim 2, Nguyen teaches the thermal transfer material of claim 1, wherein the thermal material is further coupled to a substrate.

Pertaining to claim 3, Nguyen teaches the thermal transfer material of claim 2, wherein the

substrate comprises silicon.

Pertaining to claim 4, Nguyen teaches the thermal transfer material of claim 1, wherein the thermal transfer material further comprises at least one adhesive component.

Pertaining to claim 5, Nguyen teaches the thermal transfer material of claim 1, wherein the at least one adhesive component is coupled to the heat spreader component.

Pertaining to claim 6, Nguyen teaches the thermal transfer material of claim 4, wherein the at least one adhesive component is coupled to the thermal interface material.

Pertaining to claim 7, Nguyen teaches the thermal transfer material of claim 4, wherein the at least one adhesive component is mixed into at least some of the thermal interface material.

Pertaining to claim 8, Nguyen teaches the thermal transfer material of claim 1, wherein the heat spreader component comprises a metal, a metal-based material, a high-conductivity non-metal or combination thereof.

Pertaining to claim 9, Nguyen teaches the thermal transfer material of claim 8, wherein the heat spreader component comprises nickel, aluminum, copper or a combination thereof.

Pertaining to claim 10, Nguyen teaches the thermal transfer material of claim 9, wherein the

metal-based material or high- conductive non-metal comprises silicon, carbon, copper, graphite, diamond or a combination thereof.

Pertaining to claim 11, Nguyen teaches the thermal transfer material of claim 10, wherein the heat spreader component comprises a thickness of about 0.25 mm to about 6 mm.

Pertaining to claim 12, Nguyen teaches the thermal transfer material of claim 11, wherein the thickness is from about 0.5 mm to about 5 mm.

Pertaining to claim 13, Nguyen teaches the thermal transfer material of claim 1, wherein the thermal interface material comprises a crosslinkable thermal interface material.

Pertaining to claim 14, Nguyen teaches the thermal transfer material of claim 1, wherein the thermal interface material comprises a phase change material.

Pertaining to claim 15, Nguyen teaches the thermal transfer material of claim 1, wherein the thermal interface material comprises a polymer solder material, a polymer solder hybrid material or a combination thereof.

Pertaining to claim 16, Nguyen teaches the thermal transfer material of claim 1, wherein the thermal interface material comprises a conductive filler, a metallic material, a solder alloy and combinations thereof.

Pertaining to claim 17, Nguyen teaches a method of forming a thermal transfer material, comprising:

providing a heat spreader component, wherein the heat spreader component comprises a top surface, a bottom surface and at least one heat spreader material;

providing at least one thermal interface material, wherein the thermal interface material is directly deposited onto the bottom surface of the heat spreader component; and

depositing the at least one thermal interface material onto the bottom surface of the heat spreader component.

Pertaining to claim 18, Nguyen teaches the method of claim 17; wherein the thermal transfer material further comprises at least one adhesive component.

Pertaining to claim 19, Nguyen teaches the method of claim 18, wherein the at least one adhesive component is coupled to the heat spreader component.

Pertaining to claim 20, Nguyen teaches the method of claim 18, wherein the at least one adhesive component is coupled to the thermal interface material.

Pertaining to claim 21, Nguyen teaches the method of claim 18, wherein the at least one adhesive component is mixed into at least one of the thermal interface material.

Art Unit: 2823

Pertaining to claim 22, Nguyen teaches the method of claim 17, wherein the heat spreader component comprises a metal, a metal-based material, a high-conductivity non-metal or a combination thereof.

Pertaining to claim 23, Nguyen teaches the method of claim 22, wherein the heat spreader component comprises nickel, aluminum, copper or a combination thereof.

Pertaining to claim 24, Nguyen teaches the method of claim 22, wherein the metal-based material or high- conductive nonmetal comprises silicon, carbon, copper, graphite, diamond or a combination thereof.

Pertaining to claim 25, Nguyen teaches the method of claim 17, wherein the heat spreader component comprises a thickness of about 0.25 mm to about 6 mm.

Pertaining to claim 26, Nguyen teaches the method of claim 25, wherein the thickness is from about 0.5 mm to about 5 mm.

Pertaining to claim 27, Nguyen teaches the method of claim 17, wherein the thermal interface material comprises a crosslinkable thermal interface material.

Pertaining to claim 28, Nguyen teaches the method of claim 17, wherein the thermal interface material comprises a phase change material.

Pertaining to claim 29, Nguyen teaches the method of claim 17, wherein the thermal interface material comprises a polymer solder material.

Pertaining to claim 30, Nguyen teaches the method of claim 17, comprises a conductive filler, a metallic material, a solder alloy and combinations thereof.

Pertaining to claim 31, Nguyen teaches a method for forming an IC package, comprising:
providing a thermal transfer material; providing at least one adhesive component; providing at least one surface or substrate;
coupling the at least one thermal transfer material with the at least one adhesive component to form an adhesive unit; and coupling the adhesive unit to the at least one surface or substrate to form a thermal package.

Pertaining to claim 32, Nguyen teaches the method of claim 31, further comprising coupling an additional layer or component to the thermal package.

Pertaining to claim 33, Nguyen teaches the method of claim 31, wherein the thermal transfer material comprises the thermal transfer material of claim 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. David Coleman whose telephone number is 571-272-1856. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W. David Coleman
Primary Examiner
Art Unit 2823

/W. David Coleman/
Primary Examiner, Art Unit 2823